MPEG-1 itself, is inherently file-oriented and does not support playback of continuous sources such as cameras via a network. Before Media Player begins to play back a received video file, it must first be informed of certain parameters including file name and file length. This is incompatible with the concept of a continuous streaming source, which may not have a filename and which has no definable file length. Moreover, the time stamping mechanism used by Media Player is fundamentally incompatible with the time stamping scheme standardized by the MPEG-1 standard. MPEG-1 calls out a time stamping mechanism which is based on a continuously incrementing 94 kHz clock located within the encoder. Further, the MPEG-1 standard assumes no Beginning-of-File marker, since it is intended to produce a continuous stream.

Q1

(2.) Please amend paragraph 6, page 2 as follows:

[0006] The subject invention is directed to a streaming video system for capturing, encoding and transmitting continuous video from a camera to a display monitor via a network that includes an encoder for receiving a video signal from the camera, the encoder producing a high-resolution output signal and a low-resolution output signal representing the video signal, a router or switch for receiving both the high-resolution output signal and the low-resolution output signal and a display monitor in communication with the router for selectively displaying either the high-resolution output signal or the low-resolution output signal. It will be understood by those skilled in the art that the terms "router and/or switch" as used herein is intended as a generic term for receiving and rerouting a plurality of signals. Hubs, switched hubs and intelligent routers are all included in the terms "router and/or switch" as used herein.

Q2

(3.) Please amend paragraph 8, page 2 as follows:

[0008] The system includes a selector for selecting between the high-resolution output signal and the low-resolution output signal based on the dimensional size of the display. The selector may be adapted for manually selecting between the high-resolution output signal and the low-resolution output signal. Alternatively, a control device may be employed for automatically selecting between the high-resolution output signal and the low-resolution output signal based on the size of the display. In one aspect of the invention, the control device may be adapted to assign a priority to an event captured at a camera and selecting between the high-resolution output signal and the low-resolution output signal based on the priority of the event.

Q3

(4.) Please amend paragraph 10, page 3 as follows:

[0010] The video system of the subject invention is adapted for supporting the use of a local-area-network (LAN) or wide-area-network (WAN), or a combination thereof, for distributing digitized camera video on a real-time or "near" real-time basis. In the preferred embodiment of the invention, the system uses a plurality of video cameras, disposed around a facility to view scenes of interest. Each camera captures the desired scene, digitizes (and encodes) the resulting video signal, compresses the digitized video signal, and sends the resulting compressed digital video stream to a multicast address. One or more display stations may thereupon view the captured video via the intervening network. Streaming video produced by the various encoders is transported over a generic IP network to one or more users. User workstations contain one or more ordinary PC's, each with an associated video monitor. The user interface is provided by an HTML application within an industry-standard browser, for example Microsoft Internet Explorer.

Q4

(5.) Please amend paragraph 16, page 4 as follows:

Q5

[0016] Edit various operating parameters of the encoders. This is done by pointing to the desired camera, then right-clicking the mouse. The user interface then drops a dynamically-generated menu list which allows the user to adjust the desired encoder parameters.

(6.) Please amend paragraph 22, page 5 as follows:

[0022] However, when the user subdivides a video display area into a 3 x 3 array, the demand on network bandwidth is 9 times higher than in the single-display example. And when the user subdivides the video display area into a 4 x 4 array, the network bandwidth requirement is 16 times that of a single display. To prevent network congestion, video images in a 3 x 3 or 4 x 4 array are obtained from the low-resolution, low-speed stream of the desired encoder. Ultimately, no image resolution is lost in these cases, since the actual displayed video size decreases as the screen is subdivided. That is, if a higher-resolution image were sent by the encoder, the image would be decimated anyway in order to fit it within the available screen area. It is therefore, an object and feature of the subject invention to provide the means and method for displaying "live" streaming video over a commercially available media player system. It is a further object and feature of the

Q6

Q6 subject invention to provide the means and method for permitting multiple users to access and view the live streaming video at different time, while in process without interrupting the transmission.

(7.) Please amend paragraph 30, page 6 as follows:

[0030] The preferred digital encoders E1, E2...En produce industry-standard MPEG-1 digital video streams. The use of MPEG-1 streams is advantageous due to the low cost of the encoder hardware, and to the ubiquity of software MPEG-1 players. However, difficulties arise from the fact that the MPEG-1 format was designed primarily to support playback of recorded video from a video CD, rather than to support streaming of "live" sources such as cameras. MPEG-1 system streams Q7 contain multiplexed elementary bit streams containing compressed video and audio. Since the retrieval of video and audio data from the storage medium (or network) tends to be temporally discontinuous, it is necessary to embed certain timing information in the respective video and audio elementary streams. In the MPEG-1 standard, these consist of Presentation Timestamps (PTS) and, optionally, Decoding Timestamps (DTS). On desktop computers, it is common practice to play MPEG-1 video and audio using a proprietary software package such as, by way of example, the Microsoft Windows Media Player. This software program may be run as a standalone application, otherwise components of the player may be embedded within other software applications.

(8.) Please amend paragraph 33, page 7 as follows:

[0033] When invoking Media Player to view the streaming camera video, it is first necessary to inform Media Player of the file length. Since the camera produces a stream rather than a discrete Q8 file, the file length is undefined. In order to overcome this problem all of the Media Player's 63-bit file length variables are set to 1. Media Player compares this value to a free-running counter that counts ticks of a 10 MHz clock. This counter is normally initialized to zero at the beginning of the file. Given 63 bits, this permits a maximum file length of approximately thirty thousand years, longer than the useful life of the product or, presumably, its users. This effectively allows the system to play streaming sources.

(9.) Please amend paragraph 36, page 8 as follows:

Q9 **[0036]** Any given source of encoded video may be viewed by more than one client. This could hypothetically be accomplished by sending each recipient a unique copy of the video stream.

However, this approach is tremendously wasteful of network bandwidth. A superior approach is to transmit one copy of the stream to multiple recipients, via Multicast Routing. This approach is commonly used on the Internet, and is the subject of various Internet Standards (RFC's). In essence, a video source sends its video stream to a Multicast Group Address, which exists as a port on a Multicast-Enabled network router or switch. The router or switch then forwards the stream only to IP addresses, which have known recipients. Furthermore, if the router or switch can determine that multiple recipients are located on one specific network path or path segment, the router or switch sends only one copy of the stream to that path.

Q9

(10.) Please amend paragraph 45, page 10 as follows:

[0045] The system includes a selector for selecting between the high-resolution output signal and the low-resolution output signal based on the dimensional size of the display. The selector may be adapted for manually selecting between the high-resolution output signal and the low-resolution output signal. Alternatively, a control device may be employed for automatically selecting between the high-resolution output signal and the low-resolution output signal based on the size of the display. In one aspect of the invention, the control device may be adapted to assign a priority to an event captured at a camera and selecting between the high-resolution output signal and the low-resolution output signal based on the priority of the event.

Q10

(11.) Please amend paragraph 51, page 12 as follows:

[0051] Referring now to Fig. 4, when the user has configured the video display area to display a single image, that image is obtained from the desired encoder using the higher-resolution, higher-bit rate stream. The same is true when the user subdivides the video display area into a 2 x 2 array; the selected images are obtained from the high-resolution, high-bit rate streams from the selected encoders. The network bandwidth requirements for the 2 x 2 display array are four times the bandwidth requirements for the single image, but this is still an acceptably small usage of the network bandwidth.

Q11